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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/500,317	06/28/2004	Shinichi Kawasaki	12088/019001	9863
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/500,317	Applicant(s) KAWASAKI ET AL.	
	Examiner Rudy Zervigon	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 60-69 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 60-69 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 June 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>7/23/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 13, 2007 and May 14, 2007 are entered.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "integral case body", "second case body" must be shown or the features canceled from the claims. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will

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be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: See above drawing objections.

Claim Rejections - 35 USC § 102

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 60-62, 65, 66, and 69 are rejected under 35 U.S.C. 102(a,e) as being anticipated by Denes, Ferencz S. et al. (US 20030129107 A1). Denes teaches a plasma (100; Figure 1,2; [0025]-[0026]) surface processing apparatus (Figure 2; [0025]-[0026]) for processing a surface of a material to be processed (200; Figure 2; [0025]-[0026]) with a processing gas plasmatized (100; Figure 1,2; [0025]-[0026]) under an electric field, said apparatus (Figure 2; [0025]-[0026]) having an electrode structure (Figure 3; [0033]) for generating said electric field, said electrode structure (Figure 3; [0033]) comprising: a metallic electrode body (140; Figure 1,3; [0033]) having a plasma generating surface (outer surfaces of 140, 130; Figure 3; [0015]); and an integrally¹ formed dielectric (“insulating layer” - “ceramic coating”; Figure 3; [0015]) case body (114+140+148+138; Figure 3; [0033]) which has an opening (inner area of 114; Figure 1) and an internal space (volume occupied by 140; Figure 3) communicated to said opening, said electrode body (140; Figure 1,3; [0033]) being received in said internal space (volume occupied by 140;

¹ Integral – *adjective*. 2: composed of integral parts. <http://mw1.merriam-webster.com/dictionary/integral>.

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Figure 3) through said opening (inner area of 114; Figure 1) said plasma generating surface (outer surfaces of 140, 130; Figure 3; [0015]) being closely covered with said dielectric (“insulating layer” - “ceramic coating”; Figure 3; [0015]) case body as dielectric (“insulating layer” - “ceramic coating”; Figure 3; [0015]) layer thereof, said dielectric (“insulating layer” - “ceramic coating”; Figure 3; [0015]) case body (114+140+148+138; Figure 3; [0033]) being provided with a protrusive end part (114; Figure 3; [0033]) on a side of said opening (inner area of 114; Figure 1) thereof, said protrusive end part (114; Figure 3; [0033]) being protruded relative to said electrode body (140; Figure 1,3; [0033]), as claimed by claim 60

Denes further teaches:

- i. An electrode structure (Figure 3; [0033]) according to claim 60, further comprising: a lid (112; Figure 1,3; [0037]) made of a solid dielectric (“insulating layer” - “ceramic coating”; Figure 3; [0015]) material for closing said opening, an end part of said lid (112; Figure 1,3; [0037]) covering an end surface of said protrusive end part (114; Figure 3; [0033]) in a location more forward in a direction where said protrusive end part (114; Figure 3; [0033]) is protruded relative to said electrode body (140; Figure 1,3; [0033]), as claimed by claim 61
- ii. a plasma (100; Figure 1,2; [0025]-[0026]) surface processing apparatus (Figure 2; [0025]-[0026]) for processing a surface of a material to be processed (200; Figure 2; [0025]-[0026]) with a processing gas plasmatized (100; Figure 1,2; [0025]-[0026]) under an electric field, said apparatus (Figure 2; [0025]-[0026]) having an electrode structure (Figure 3; [0033]) for generating said electric field, said electrode structure (Figure 3; [0033]) comprising: an elongate metallic first electrode body (140; Figure 1,3; [0033])

having a first plasma generating surface (outer surfaces of 140, 130; Figure 3; [0015]); an integrally¹ formed dielectric (“insulating layer” - “ceramic coating”; Figure 3; [0015]) first case body (114+140+148+138; Figure 3; [0033]) which has a first opening and a first internal space (volume occupied by 140; Figure 3) communicated to said first opening (inner area of 114; Figure 1), said first electrode body (140; Figure 1,3; [0033]) being received in said first internal space (volume occupied by 140; Figure 3) through said first opening, said first plasma generating surface (outer surfaces of 140, 130; Figure 3; [0015]) being closely covered with said first dielectric (“insulating layer” - “ceramic coating”; Figure 3; [0015]) case body as dielectric (“insulating layer” - “ceramic coating”; Figure 3; [0015]) layer thereof, said first dielectric (“insulating layer” - “ceramic coating”; Figure 3; [0015]) case body being provided with a first protrusive end part on a side of said first opening thereof, said first protrusive end part (114; Figure 3; [0033]) being protruded relative to said first electrode body (140; Figure 1,3; [0033]) an elongate metallic second² electrode body (any other 140; Figure 1,3; [0033] - claim 63 requires “separation”) having a second plasma generating surface (outer surfaces of any other 140, 130; Figure 3; [0015]) and extending in a same direction as said first electrode body (140; Figure 1,3; [0033]); and an integrally formed dielectric (“insulating layer” - “ceramic coating”; Figure 3; [0015]) second case body (any other 114+148+138; Figure 3; [0033] - claim 63 requires “separation” of “first” and “second” parts) which has a second opening (inner area of 114; Figure 1) and a second internal space (volume occupied by 140; Figure 3) communicated to said second opening (inner area of 114;

² See Claim 63 – “separately formed”

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Figure 1), said second electrode body (any other 140; Figure 1,3; [0033] - claim 63 requires “separation”) being received in said second internal space (volume occupied by 140; Figure 3) through said second opening (inner area of 114; Figure 1), said second plasma generating surface (outer surfaces of any other 140, 130; Figure 3; [0015]) being closely covered with said second dielectric (“insulating layer” - “ceramic coating”; Figure 3; [0015]) case body as dielectric (“insulating layer” - “ceramic coating”; Figure 3; [0015]) layer thereof, said second dielectric (“insulating layer” - “ceramic coating”; Figure 3; [0015]) case body (any other 114+148+138; Figure 3; [0033] - claim 63 requires “separation” of “first” and “second” parts) being provided with a second protrusive end part (114; Figure 3; [0033]) on a side of said second opening (inner area of 114; Figure 1) thereof, said second protrusive end part (114; Figure 3; [0033]) being protruded relative to said second electrode body (any other 140; Figure 1,3; [0033] - claim 63 requires “separation”), Dene’s first dielectric (“insulating layer” - “ceramic coating”; Figure 3; [0015]) case body (148, 138, 122; Figure 3; [0033]) and said second dielectric (“insulating layer” - “ceramic coating”; Figure 3; [0015]) case body (any other 148, 138, 122; Figure 3; [0033]) defining a gas passage in between, said gas passage allowing said processing gas to pass there through in a direction orthogonal to said direction in which said Dene’s first electrode body (140; Figure 1,3; [0033]) and said second electrode body (any other 140; Figure 1,3; [0033] - claim 63 requires “separation”) extend, as claimed by claim 62

- iii. An electrode structure (Figure 3; [0033]) according to claim 62, wherein said first dielectric (“insulating layer” - “ceramic coating”; Figure 3; [0015]) case body (148, 138,

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- 122; Figure 3; [0033]) and said second dielectric (“insulating layer” - “ceramic coating”; Figure 3; [0015]) case body (any other 148, 138, 122; Figure 3; [0033]) are integrally connected to one another, as claimed by claim 65
- iv. An electrode structure (Figure 3; [0033]) according to claim 62, wherein flow passage (142; Figure 3; [0033]) sectional area of said gas passage (142; Figure 3; [0033]) varies along a direction of gas flow, as claimed by claim 66 – horizontal 142 is shown as a smaller area than vertical 142.
- v. An electrode structure (Figure 3; [0033]) according to claim 62, wherein said first dielectric (“insulating layer” - “ceramic coating”; Figure 3; [0015]) case body (148, 138, 122; Figure 3; [0033]) is provided with a gas uniformizing passage (142; Figure 3; [0033]) for dispersing said processing gas uniformly in a direction in which said first electrode body (140; Figure 1,3; [0033]) extends and for introducing said processing gas into said flow passage (142; Figure 3; [0033]), as claimed by claim 69

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 63 and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Denes, Ferencz S. et al. (US 20030129107 A1) in view of Watabe; Masahiro (US 5500256 A). Denes is discussed above.

Denes does not teach:

- i. An electrode structure (Figure 3; [0033]) according to claim 62, wherein said first dielectric (“insulating layer” - “ceramic coating”; Figure 3; [0015]) case body (148, 138,

- 122; Figure 3; [0033]) and said second dielectric (“insulating layer” - “ceramic coating”;
Figure 3; [0015]) case body (any other 148, 138, 122; Figure 3; [0033]) are separately
formed, as claimed by claim 63
- ii. An electrode structure (Figure 3; [0033]) according to claim 63, wherein said first
dielectric (“insulating layer” - “ceramic coating”; Figure 3; [0015]) case body (148, 138,
122; Figure 3; [0033]) has an opposing surface abutted with said second dielectric
(“insulating layer” - “ceramic coating”; Figure 3; [0015]) case body (any other 148, 138,
122; Figure 3; [0033]), and said opposing surface is provided with a recess to serve as
said gas passage (142; Figure 3; [0033]), as claimed by claim 64

Watabe teaches an electrode plasma apparatus (Figure 3) including unmixed gas injection
plenums (1x-3x; Figure 4A,B; column 5; lines 18-44; column 1; lines 65-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made
to reproduce and/or make separable Denes's electrode structure (Figure 3; [0033]).

Motivation to reproduce and/or make separable Denes's electrode structure (Figure 3; [0033]) is
for introducing unmixed and unreacted gases into processing as taught by Watabe (column 2;
lines 61-67). It is well established that the duplication of parts is obvious (In re Harza , 274 F.2d
669, 124 USPQ 378 (CCPA 1960) MPEP 2144.04). Further, it has been held that it is obvious to
make whole elements separable (In re Dulberg, 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA
1961) – MPEP 2144.04

8. Claims 67 and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Denes,
Ferencz S. et al. (US 20030129107 A1) in view of Anders; Andre et al. (US 6137231 A). Denes
is discussed above. Denes does not teach:

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- i. An electrode structure (Figure 3; [0033]) according to claim 62, wherein Dene's first dielectric ("insulating layer" - "ceramic coating"; Figure 3; [0015]) case body (148, 138, 122; Figure 3; [0033]) has a plate (138; Figure 3; [0033]) dividing said gas passage (142; Figure 3; [0033]) and said first internal space (volume occupied by 140; Figure 3), and a thickness of said plate (138; Figure 3; [0033]) varies along a direction of gas flow in said gas passage (142; Figure 3; [0033]), as claimed by claim 67
- ii. An electrode structure (Figure 3; [0033]) according to claim 62, wherein a distance between said Dene's first electrode body (140; Figure 1,3; [0033]) and said second electrode body (any other 140; Figure 1,3; [0033] - claim 63 requires "separation") varies along a direction of gas flow in said gas passage (142; Figure 3; [0033]), as claimed by claim 68

Anders teaches a similar plasma source array (Figure 9). Specifically, Anders teaches a thickness of said plate/electrode (164/162; Figure 9) varies along a direction of gas flow in said gas passage (from 160 to outside of the structure; Figure 9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to dimension Denes's plate/electrode such that a thickness/distance varies along a direction of gas flow in said gas passage.

Motivation to dimension Denes's plate/electrode such that a thickness/distance varies along a direction of gas flow in said gas passage is for forming high quality films resulting from a "constriction" (column 4, lines 54-67; column 3, lines 1-13).

Response to Arguments

9. Applicant's arguments filed April 13, 2007 have been fully considered but they are not persuasive.

10. Applicant's amendments to the specification and drawings is acknowledged. In response, the Examiner removes his 112 rejections and the majority of his drawing objections. If Applicant can further argue or amend to explain "integral case body" and "second case body" the Examiner will remove the remaining drawing and specification objections.

11. Applicant states:

“

The Examiner rejects claims 60 and 62 on the basis that the “integrally formed dielectric case body” of claims 60 and 62 is shown by element 114 of Denes. However, the Applicant respectfully asserts that Denes fails to show or suggest all the necessary limitations that claims 60 and 62 require, as amended. Specifically, the limitations of claims 60 and 62 require that the electrode body has a "plasma generating surface" that is "closely covered with said dielectric case body as dielectric layer thereof." Element 114 of Denes does not closely cover a "plasma generating surface" of an electrode body 140 to provide a dielectric layer for the plasma generating surface. The electrode body 140 has many holes, and the inner peripheral surface of each of the holes of the electrode body 140 is the "plasma generating surface," which is then covered with a dielectric layer 148, not with the element 114. The element 114 does surround three outer surfaces of the electrode body 140, but none of these outer surfaces of the electrode body 140 is the "plasma generating surface" of claim 60.

“

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In response, as asserted above by the Examiner, Denes indeed teaches Applicant's amended claim requirements. Applicant's "closely covered" claim language and argument is relative and is completely within the anticipation of the Denes teachings as discussed above. Further, any powered electrode has, as its property, a surface defined by its geometry that is "plasma generating" per rudimentary electrostatic physical laws as acknowledged by the prior art as represented by Denes.

Applicant states:

"

Additionally, Denes fails to teach or disclose "a protrusive end part," as recited in independent claims 60 and 62. A first electrode 130 of Denes has a dielectric layer 138 that has an opening. However, the opening end of the dielectric layer 138 stops prior to reaching the first electrode bed 136. The region between the electrode bed 136 and first electrode 130 is disclosed in Denes as the base 132 of the electrode 130. This shows that the dielectric layer of Denes stops short and does not extend to, much less protrude over, the edge of the first electrode. Therefore, the dielectric layer 138 does not have "a protrusive end part" as claimed in independent claims 60 and 62 of the invention.

"

In response, the Examiner disagrees. Denes indeed teaches a dielectric ("insulating layer" - "ceramic coating"; Figure 3; [0015]) case body (114+140+148+138; Figure 3; [0033]) being provided with a protrusive end part (114; Figure 3; [0033]). It is well established that claim terms are issued their "plain meaning" according to MPEP 2111.01: Claim terms are presumed to have the ordinary and customary meanings attributed to them by those of ordinary skill in the art.

Sunrace Roots Enter. Co. v. SRAM Corp., 336 F.3d 1298, 1302, 67 USPQ2d 1438, 1441 (Fed. Cir. 2003); Brookhill-Wilk 1, LLC v. Intuitive Surgical, Inc., 334 F.3d 1294, 1298 67 USPQ2d 1132, 1136 (Fed. Cir. 2003). Applicant's claims have provided no further claim qualifications excluding Denes under anticipation regarding the claimed "protrusive end part".

Applicant states:

"

Additionally, Denes discloses another electrode member type 140 and 150 which is covered by a dielectric layer 148. This dielectric layer 148 does not have "an opening" as required by the present invention. Specifically, claims 60 and 62 state, "said electrode body is received in said internal space through said opening." Without the claimed opening, the protrusive end as claimed is also necessarily missing. Thus, Denes' electrode members 140 and 150 and dielectric later 148 also fail to teach or disclose "a protrusive end part" as recited in independent claims 60 and 62 of the invention

"

12. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "dielectric layer does not have "an opening" ") are not recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Specifically, it is the claimed "case body", not the "dielectric layer" that is claimed to have the "opening". In response, Denes' claimed integrally³ formed dielectric ("insulating layer" - "ceramic coating";

³ Integral – *adjective*. 2: composed of integral parts. <http://mw1.merriam-webster.com/dictionary/integral>.

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Figure 3; [0015]) case body (114+140+148+138; Figure 3; [0033]) which has an opening (inner area of 114; Figure 1) completely anticipates Applicant's claims.

13. Applicant's remaining arguments address the Examiner's proposed obviousness rejections based on the above arguments that Denes' disclosure purported does not teach numerous claimed features. In response, the Examiner sustains his positions and interpretation of the Denes disclosure.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (571) 273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435


8/6/7